



KONVEKTA

Technical leadership starts with ideas.

Operating Instruction

for KONVEKTA Air Conditioning unit

KL40T / KL45T / KL45T



with control KS50

Versions:

- 12 / 24 Volt DC
- Recirculated Air
- Fresh Air
- Heating

ID#: BBA-KL40T12AH

Version: A03

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- Maintenance Schedule Bus [WP07050618](#)

Introduction

These operating instructions have been written for drivers, operators and the maintenance staff of your air conditioning unit.

In this context, we refer implicitly to the compliance with our general installation guidelines. These can be obtained from the KONVEKTA technical after sales service: TKD@konvekta.com.

Please observe our valid safety instructions, available under www.konvekta.de/asv.html. In case of order placement or any other conclusion of contract the safety instructions get integral part of the contract.

These operating instructions have to be read carefully and made use of before the first start-up and after that regularly by each person who is involved in handling the machine:

- Operation including troubleshooting and waste disposal of fuels and auxiliary agents.
- Servicing, inspection, repair
- Transport

This facilitates the handling and avoids trouble caused by improper operation. Working in compliance with these operating instructions increases operation reliability and service life of the air conditioning unit and reduces life cycle costs.

-  **Please complete these instructions by adding the national provisions for prevention of accidents and environmental protection.**
-  **These instructions are part of the air conditioning unit. Always have a copy at hand in the driver's cabin.**

You will certainly understand that we will not recognize any warranty claims due to unproper handling, inadequate maintenance, applications that do not correspond with the determined use, utilization of unadmitted fuels or the non-observance of safety provisions.

KONVEKTA will annul without prenotice all obligations concerning guarantee, service contracts etc. regardless if granted by KONVEKTA or its distributors in case other than original KONVEKTA spare parts or parts bought from KONVEKTA AG have been used for maintenance and repair.

These operating instructions contain all necessary information to operate your air conditioning unit. In case you need more explanations please contact the next KONVEKTA service station[®].

[®] On our website www.konvekta.com in category >service< you will find a survey of contact details of all our service partners close to your location.

Information on the operating instructions

These operating instructions are valid for the a/c-units type:

- **KL40T/12V** • **KL45T/12V** • **KL46T/12V**
- **KL40T/24V** • **KL45T/24V** • **KL46T/24V**

When taking the unit into operation we recommend adding the following data. This will also be important for your orders of spare parts, and in case of warranty.

Serial number of the unit:

Order No.:

Year of construction: (MM/JJ)

Date of first operation: (TT/MM/JJ)

The machine is in accordance with the EC machinery directive 2006/42/EC.

The unit contains or needs fluorinated greenhouse gas for operation and is subject to identification requirements in accordance with F-Gas Regulation 517/2014.

Due to the fact that scope of supply depends on the order, equipment of your product may differ in some parts of description.

In case your product is equipped with details not shown or described in the operating instruction, your KONVEKTA -Service-Station will always be at disposal for informing you about correct operation.

In the course of further developments we reserve the right to technical modifications without prenotice. Guarantee and liability conditions of **KONVEKTA AG**'s general business conditions are not enlarged by the above notes.

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Manufacturer: **KONVEKTA AG, P.O. Box 2280, D-34607 Schwalmstadt**

1. Technical data



Important!

In vehicles that are equipped with an a/c unit with heating function the heating medium has to consist of water/glycol – antifreeze protection (conform the mixing ratio to manufacturers' instructions). This is absolutely necessary to prevent the heaters from frost damage!
(The prevalent antifreeze filling of the vehicle manufacturers goes down to -40 °C)

Type:		KL40T	KL45T	KL46T
Refrigerant		R134a		
GWP		1.430		
- quantity with front box	[kgs] approx.	2,5	2,5	2,5
		3,3	3,3	3,3
Operating voltage	[Volt DC]	12	12	12
		24	24	24
Current consumption (3-stage) at 13V: (3-stage) at 26V: (stageless) at 26V	[Ampere]	88	88	88
		44	44	44
		53	53	53
Cooling capacity with K VX40 K VX30 or TM31 TM21	[Watt]	18.000	18.000	21.000
		15.000.	15.000.	-
		12.000	12.000	-
Heating capacity Q= 100	[Watt]	25.000	25.000	25.000
Evaporator – Air volume*, free-blowing	[m³/h] 3-stage stageless	4.000	4.000	4.000
		4.400	4.400	4.400
Measurements:				
- length	[mm]	1.966	1.985	1.985
- width	[mm]	1.368	1.336	1.336
- height, - depending on roof radius	[mm]	221	234	239
		188	188	193
Weight of unit, Version:				
- Recirculated Air	[kgs] approx.	65,5	78,5	81
- Fresh Air	[kgs] approx.	66,5	79,5	82
- Heating	[kgs] approx.	69	82	84

* With standard fans and/or blowers

1.1. Compressors



Important to avoid leakages at the shaft seal of the compressor:

The compressor should be started every 4 weeks for approx. 15 minutes!

This also applies when the vehicle is not into operation for a longer period or when the air conditioning unit is not used!

⇒ **Compressor type depending on scope of delivery, see identification plate at compressor.**

Kompressor Typ	K VX40/390	K VX30/325	HDC 33	TM21
Weight (kgs) approx.	33	24,5	15,5	9,7
Oil brand	Esteröl SE55	Esteröl SE55	ZXL 100PG	ZXL 100PG
- quantity (kgs)	2	2	0,5	0,18
Magnetic clutch ¹⁾	12 / 24V DC	12 / 24V DC	12 / 24V DC	12 / 24V DC
- Weight (kgs)	12	7,6		

¹⁾ ø depending on vehicle type

2. Determined use

The **KONVEKTA** air conditioner represents an air conditioning system that works with the ozone friendly refrigerant R 134a and which creates a pleasant and individually adjustable room temperature by means of forced convection. The determined use includes also the observance of the Operating instruction and the proof of regular inspections as well.

3. Generally information for a/c unit



Attention in case of roof top a/c units: Never switch on the a/c unit during car-wash!

- The a/c unit is operational with running engine only.
- At cooling operation the humidity inside the vehicle is decreased, which avoids steamed up windows. The a/c unit works most effectively with windows and doors shut. If, however, the interior of the standing vehicle has been heated up severely by exposure to sunlight, short-time opening of windows and doors may accelerate the cooling down process.
- At high outside temperature and humidity condensate might drip off the evaporator and make a puddle under the vehicle. This is quite normal and no sign for a leakage.
- The filter in the return air grid (optional) retains pollution. If the external air is contaminated with gas switch over to return air operation. The filter should be cleaned or replaced respectively on a regular basis so that the capacity of the a/c unit is not affected.
- **If you think that the a/c unit is damaged, switch it off immediately.** To avoid further damage have it check at a KONVEKTA Service Station[®]. Only after that you can take unit into operation.

[®] On our website www.konvekta.com in category >service< you will find a survey of contact details of all our service partners close to your location

3.1. Operating Conditions

NOTE: KONVEKTA uses components made of copper and aluminium, which last a whole unit life-time under normal environmental conditions. Should the units be operated under aggressive environmental conditions, i.e. air containing salt-, phosphate- or ammoniac extremely, a corrosion of the copper- and aluminium components can not be ruled out. The copper- and aluminium components of the KONVEKTA systems are not suitable for such extreme application conditions. We indicate emphatically, that corrosion is not subject to warranties for defects. KONVEKTA does not take over any warranties for defect, neither for corrosion nor for consequential damage resulting there from, nor for damages caused by cleaning the systems with highly compressed or corrosion advancing substances.

4. Introduction control KS50

The **KS50** is a climate controller for air conditioning systems in modern vehicles. Due to its compact design the controller can be mounted easily in the dash board of the vehicle. The clear arrangement of the symbols and the easy handling relieve the driver and meet all demands of optimal air conditioning control.



4.1. Installation

1. Choose suitable mounting place (the controller must not be exposed to direct solar radiation through the windshield) and prepare a mounting cutout; width = 90,2 mm, height = 43,0 mm.
2. After the installation (wires laid out along the vehicle and 24-polar connecting plug positioned in the dashboard control seat) plug the connection plug on the controller.
3. Insert the controller in the mounting cutout until the lateral mounting brackets lock.

4.2. Demounting

1. Open the accordant cover in the dash board to get access to the back side of the controller.
2. Press the mounting brackets together, either by hand or with a tool, and push the controller forward.
3. Take off the plug and remove the controller.

5. Operation

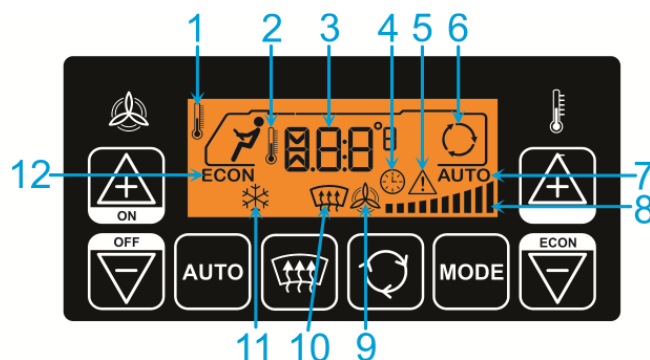


Danger of accident!

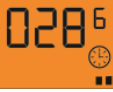
- Focussing your attention on the road traffic is of top priority
- Only operate your air conditioning unit when the traffic situation allows it
- Make sure you can clearly recognize and read all operation- and display-elements at any time
- Protect all displays against irritating sunglare and any other optical disturbances
- Please note that the control panel keys have not been designed for heavy stressing
- Excessive or fast pressing of the keys for adjusting the set temperature does not accelerate the cooling down process. It possibly damages the control panel and so affects the general performance of the airconditioning unit

5.1. Description of the display (LCD symbols)

Symbol	Acceptation of the display symbols
1	Ambient temperature is displayed
2	Room temperature is displayed
3	4-digit 7-segment display for various values
4	Display of operating hours
5	Warning: an error is recorded
6	Recirculating air operation is activated
7	Automatic blower control is activated
8	Bar display for blower speed in manual blower control mode
9	Manual blower control is activated
10	Demisting operation is activated
11	Cooling operation is activated
12	ECON operation is activated



5.2. Switch on air conditioning unit

By pressing key <i>Blowers Plus (1)</i> the A/C is switched on.	 Press
After switching on the controller carries out a self-test. The software version (here: 1.0) as well as the operating mode (here: A) are indicated for approx. 3 sec.	
After this the operating hours of the A/C unit are displayed for approx. 3 sec.  The operating hours are indicated as figure until the thousands digit. For every ten thousand digit a bar is displayed additionally (for 20000 e.g. two bars, here: 20286 hours).	
Now the A/C is ready for operation. The last stored setting is displayed.	

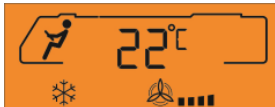
5.3. Switch off air conditioning unit

By pressing the key <i>Blowers Minus (2)</i> longer than 2 seconds the A/C is switched off.  While the key is pressed the display changes temporarily. This is no fault, no settings are changed.	 Press and hold
Now the A/C is switched off.	

5.4. Setting of the desired temperature

The set temperature is displayed (here: 22°C). Digits 1 to 3 show the set temperature, the last digit the unit °Celsius or °Fahrenheit.	
Adjustment of the set temperature with key <i>Set Temperature Plus (8)</i> .	 Press twice
The new set temperature is indicated, here 24°C.  By pressing the key <i>Set Temperature Minus (7)</i> the temperature can be decreased.	

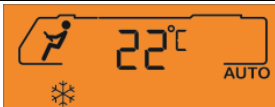
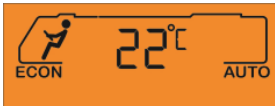
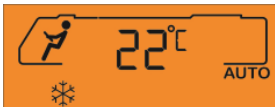
5.5. Manual adjustment of the blowers

The controller is in automatic blower operation mode. The <i>AUTO symbol (7)</i> is indicated.	
To decrease the blower speed press the key <i>Blowers Minus (2)</i> .	 Press
The AUTO symbol disappears. The <i>Blower symbol (9)</i> and the current speed in a bar diagram are displayed (here 40%).	
 In manual blower operation mode the blower speed can be adjusted with the keys <i>Blower Plus (1)</i> and <i>Blower Minus (2)</i> between the minimum speed and 100%.	
The automatic blower operation mode can be activated again by pressing key <i>AUTO (3)</i> .	 Press
The controller is in automatic blower mode. The <i>AUTO symbol (7)</i> is indicated	



Depending on the type of control mode and type of A/C unit, the blower speed can be adjusted in manual blower mode either in 10% steps, in three steps or in two steps.

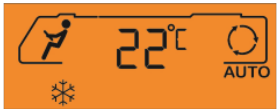
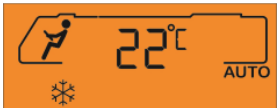
5.6. ECON operation

The <i>ECON symbol (12)</i> is not displayed. A/C operation is activated; the <i>Frosting symbol (11)</i> indicates that the unit is in cooling mode at the moment.	
The ECON mode can be activated by pressing and holding key <i>Set Temperature Minus (7)</i> .	 Press and hold
 While the key is pressed the display changes temporarily. This is no fault, no settings are changed.	
Now the ECON mode is activated and the <i>ECON symbol (12)</i> is displayed.	
 In ECON mode the compressor is locked. The A/C operates only in ventilation and heating mode.	
The ECON mode can be switched off by pressing and holding key <i>Set Temperature Minus (7)</i> .	 Press and hold
The <i>ECON symbol (12)</i> disappears. Now the A/C mode is active again and the compressor is switched on by the controller if required.	



If the ambient temperature is cold, the ECON mode should be activated to provide a comfortable climate in the vehicle and to save energy. .

5.7. Fresh and recirculating air operation

In fresh air operation mode the air flap is open, a defined share of fresh air is supplied into the interior.	
By pressing key <i>Recirculating Air (5)</i> the recirculating air mode is activated.	 Press
The symbol for <i>Recirculating Air (6)</i> is displayed.	
By pressing key <i>Recirculating Air (5)</i> once again the mode is switched back to fresh air operation.	 Press
Fresh air mode is activated again.	



Dependent on the configuration of the controller, it is also possible that the system changes automatically from recirculating to fresh air mode after a defined period of time.

5.8. Demisting operation

If the windows are steamed up, the demisting mode can be activated.	
Press key <i>Demisting (4)</i> to activate demisting operation mode.	 Press
The symbol <i>Demisting (10)</i> on the display indicates that the demisting mode is activated.	
By pressing key <i>Demisting (4)</i> again, the demisting mode gets deactivated.	 Press
Demisting mode is deactivated.	

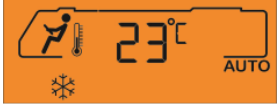


Dependent on the configuration of the controller, after a defined period of time the demisting mode is deactivated automatically.



When the demisting mode is activated the blower speed is increased to 100%. The speed can be adjusted manually on demand. But to reach maximum demisting performance the blower speed should not be decreased.

5.9. Changeover temperature display mode

In normal operation the set temperature is displayed (here 22°C).	
By pressing the key <i>MODE</i> (6) the display changes over to ambient temperature.	
The current ambient temperature (here 32°C) is displayed. The symbol <i>Ambient Temperature</i> (1) appears.	
By pressing key <i>MODE</i> (6) again the display changes back to inside temperature indication.	
The current inside temperature (here 23°C) is indicated. The symbol <i>Inside Temperature</i> (2) appears.	
By pressing key <i>MODE</i> (6) once again the display changes over to set temperature indication.	
The set temperature is displayed.	

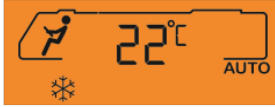


If the set temperature is adjusted while the ambient or inside temperature is indicated, the display changes over to set temperature for some seconds.



Dependent on the configuration of the controller, the display changes over automatically from ambient or inside temperature to the set temperature after some seconds.

5.10. Switch the temperature indication to °Fahrenheit

The adjusted set temperature is indicated in °Celsius:, e.g. 22 °C.	
To change the display to °Fahrenheit press and hold key <i>AUTO</i> (3).	 Press and hold
Then press key <i>MODE</i> (6) and let loose both keys.	 Press and let loose
The display changes over to °Fahrenheit.	
 When this key combination is pressed again, the display changes back to °Celsius.	



The setting of the temperature unit is persistent, also when the controller is switched off.

6. Maintenance / Servicing

Please arrange regular dates for maintenance works and services with a KONVEKTA service station, as indicated in maintenance schedule bus no. [WP07050618](#).

- Only qualified staff is allowed to carry out these works! -

For general instructions on repair – and maintenance works please contact via email:

TKD@konvekta.com



Danger of accidents!

Qualified staff in charge of installation and maintenance have to be trained in accordance with EN 378-Part 4 and (EG) No.307 / 2008 and must strictly follow the legal provisions. Any works or modifications at the air conditioner which are carried out improperly can lead to malfunction and so endanger operational reliability. We recommend having all works and modifications carried out at an authorized KONVEKTA Service Station^①. Before carrying out any maintenance works at your air conditioning unit, carefully read the KONVEKTA safety provisions (TD00052A^②) in order to avoid any dangers and accidents!

^① On our website www.konvekta.com in category >service< you will find a survey of contact details of all our service partners close to your location

^② Source of supply: **KONVEKTA AG**, P.O. Box 2280, D-34607 Schwalmstadt

6.1. Oil change Compressor type K VX

First oil change at the first maintenance of the vehicle and then approx. every 3 years. At every oil change the oil suction strainer has to be cleaned. Observe the oil quantity according to the compressor type (s. item 1.1).

6.2. Return air grid

Clean the return air grid in the passenger area monthly. In case of enormous dirt weekly.

6.3. Condenser coil

Always keep condenser coil fins clean. Severe soiling causes excess pressure within the a/c-unit system and it automatically stops working.

Attention:

The condenser coil fins have to be cleaned with compressed air at least once a year, in case of severe soiling more often.

6.4. Troubleshooting



- Only qualified staff is allowed to carry out these works! -

Trouble	Cause	Repair <i>only by refrigeration expert</i> ^①
a/c is not running	magnetic clutch / compressor is not switched on	- check inside temperature, adjust new if necessary ^② - check connections at magnetic clutch
	electric connections disconnected	check electric connections at switch-board
	relay defective	check relay, replace if necessary
	defrost thermostat has switched off	check evaporator blower, replace if necessary
	outside temperature too low (possible icing of evaporator)	switch on "ventilation" only
	evaporator coil dirty	clean evaporator coil with compressed air
	excess pressure (pressure too high)	- check axial fans - check fuses at switchboard - clean condenser coil with compressed air
LED  flashes up	excess pressure caused by high outside temperature	run unit until pressure has stabilized ^②
	leakage in a/c unit, lack of refrigerant	- check a/c unit for leakages, - refill refrigerant
	low pressure, dryer clogged	replace dryer
	low pressure, screen of expansion valve clogged	clean screen; replace dryer
	compressor does not compress	check high and low pressure, replace compressor if necessary
Loud noise at compressor	defective bearing at compressor	replace either bearing or entire compressor
	slack V-belt	check V-belt at compressor drive

^① On our website www.konvekta.com in category >service< you will find a survey of contact details of all our service partners close to your location

^② By user

7. Warranty Conditions

The current „General Warranty Conditions KONVEKTA AG“ will apply. A copy will be furnished by the warranty department. Please contact gwl@konvekta.com

8. Waste disposal in accordance with legal provisions

After the phase of use the last proprietor is responsible for the adequate waste management. The environmental regulations in the exporting country must be observed.

The following list contains the most important regulating literature, valid for the *Federal Rep. of Germany*:

- Resolution for dangerous substances
- Law for waste circulation (KRW/AfgG))
- Resolution for the proofs of utilization and removal
- Criminal Code (StGB) 28th section „criminal acts against the environment“ §326 - Environment jeopardizing waste management
- Law of chemicals § 27 - penal prescriptions
- Resolution for used oil
- Law of water balance
- Resolution for the waste management of old cars and the adaptation of road prescriptions
- Resolution (EC) No. 2037/2000 of the European Parliament and of the Council for materials that affect the ozone layer
- Resolution to prohibit certain ozone destroying halogen hydrocarbons.

The used refrigerant endangers the environment. When dealing with refrigerants the existing prescriptions and regulations are to be followed. **Only qualified staff is allowed to carry out these works!**

Water endangering substances - acc. to §§19g-19l - are solid, liquid, and gaseous substances. e.g.: mineral and tar oils (cooling oils), halogen containing organic combinations (refrigerants).

© Source of supply:
 - Bundesanzeiger
 - Beuth Verlag
 - dtv (Deutscher Taschenbuch Verlag)

9. History of modification

Version	Date	Name	Remark	File
A00	25.05.2011	B. Keßler	Source file	BAKL40T12AH
A01	30.11.2015	B. Keßler	Updated EC machinery directive.	BAKL40T12AH
A02	04.07.2016	B. Keßler	Added KL46T	BAKL40T12AH
A03	01.03.2017	B. Keßler	Information on the operating instructions and technical data expanded with F-gas-regulation	BAKL40T12AH